FEDERAL PUBLIC SERVICE COMMISSION

COMPETITIVE EXAMINATION FOR RECRUITMENT TO POSTS IN BS-17 UNDER THE FEDERAL GOVERNMENT, 2011

Roll Number

COMPUTER SCIENCE

TIME ALLOWED:	**(PART-I MCQs)**	**30 MINUTES**	**MAXIMUM MARKS: 20**
THREE HOURS	**(PART-II)**	**2 HOURS & 30 MINUTES**	**MAXIMUM MARKS: 80**

NOTE: **(i)** **First** attempt **PART-I (MCQs)** on separate Answer Sheet which shall be taken back after 30 minutes.

(ii) **Overwriting/cutting of the options/answers will not be given credit.**

(PART-I MCQs) (COMPULSORY)

Q.1. Select the best option/answer and fill in the **appropriate box** on the **Answer Sheet**. **(1 x 20=20)**

(i) Virtual memory is a memory _____ technique that allows all memory, including main memory and mass storage devices, to be addressed as part of one large logical address space.

(a) Overlapping (b) Extension (c) Management (d) Interface (e) None of these

(ii) Hyper threading technologies deliver two processing threads per physical core for a total of _____ massive computational throughout.

(a) 2 (b) 8 (c) 16 (d) 32 (e) None of these

(iii) _____ unit is capable of mimicking the processor and taking over control of the system bus just like microprocessor.

(a) Control (b) DMA (c) I/O (d) PPI (e) None of these

(iv) The ascending order of a data Hierarchy is:

(a) Bit-byte-field-record-file-database (b) Bit-byte-record-field-file-database

(c) Byte-bit-field-record-file-database (d) Byte-bit-record-field-file-database (e) None of these

(v) _____ interrupts are initiated by an I/O drive.

(a) Internal (b) External (c) Software (d) Basic (e) None of these

(vi) Software testing is a critical element of software quality assurance and represents the ultimate view of _____, _____ and _____ in that order.

(a) Code, design, specification (b) Specification, design and code generation

(c) Design, specification, code (d) Code generation, specification, design (e) None of these

(vii) _____ is an integration testing approach that is commonly used when shrinking wrapped software products are being developed.

(a) Testing (b) Smoke testing (c) Portability testing (d) Both (b) and (c) (e) None of these

(viii) Determine the result of attempting to compile and run the following code:

```
public class Tester {
public static void main(String[] args){
System.out.println(4 + '  ' +2);
        }
}
```

(a) 42 (b) 2 (c) 6 (d) 4 (e) None of these

(ix) The class relationship called generalization is the same as:

(a) Inheritance (b) Aggregation (c) Association (d) Abstraction (e) None of these

(x) A static partitioned memory management system has a total of six partitions. If one is allocated to the operating system, this will allow a total of:

(a) Five user jobs (b) Six user jobs

(c) Thirty-two user jobs (d) Thirty-six user jobs (e) Sixty-four user jobs

(xi) A transaction required to be ACID means it should be:

(a) Access, Control, Integration and Dependency (b) Atomic, Consistency, Isolation and Durability

(c) Acquire, consistency, Inter-linked and Dependency (d) Both (a) and (b) (e) None of these

(xii) If we reprocess the transaction then the database can be made to come to a state where the database is consistent and so reprocessing the log can _____ the database.

(a) Recover (b) Rollback (c) Lock (d) Append (e) None of these

(xiii) What is the major role of the DDCMP?

(a) DDCMP does not need special hardware to find the beginning of a message

(b) DDCMP has a message header (c) DDCMP has an IP Address

(d) DDCMP does not use CRC (e) None of these

(xiv) In a synchronous modem, the receiving equalizer is known as _____ equalizer.

(a) Adaptive (b) Impairment (c) Statistical (d) Compromise (e) None of these

(xv) The maximum transfer speed of 10 Base 5 is:

(a) 100 Mbps (b) 2 Mbps (c) 1 Gbps (d) 10 Mbps (e) None of these

(xvi) Which of the following is a layer 2 device?

(a) Bridge (b) Router (c) Repeater (d) Hub (e) None of these

(xvii) Identify the type of routing protocol that maintains a topological database of the network?

(a) Topological State (b) Shortest Path First

(c) Link State (d) Distance Vector (e) None of these

(xviii) The data portion of an information unit at a given OSI layer potentially can contain headers, trailers and data from all the higher layers, known as:

(a) Compression (b) Buffer (c) Encapsulation (d) Spooling (e) None of these

(xix) Identify the type of routing protocol that exchanges entire routing tables at regular intervals.

(a) Link State (b) Interior Gateway Protocols (c) Apple Talk Routing

(d) Distance Vector (e) None of these

(xx) Which environment considers memory, process and device and file management from a global viewpoint?

(a) Distributed Operating System (b) Network Operating System

(c) Multiprogramming Operating System (d) All of these (e) None of these

PART-II

NOTE: **(i)** **PART-II** is to be attempted on separate Answer Book.
(ii) **Attempt ONLY FOUR questions from PART-II, selecting at least ONE** question from each **SECTION. All questions carry EQUAL marks.**
(iii) **Extra attempt of any question or any part of the attempted question will not be considered.**
(iv) **Use of CALCULATOR is allowed.**

SECTION – A

Q.2. **(a)** Explain that: **(02+02+01=05)**

(i) In how many ways DMA process may be initiated and be terminated?
(ii) The sequence of events as DMA is requested by an I/O devices.
(iii) What happens when DMAC receives DMA request from another channel while it is serving one?

(b) Why Interrupts are employed in computer? Briefly describe basic types of Interrupts. **(05)**

(c) Differentiate between pre-emptive and non pre-emptive scheduling. Briefly describe round robin and shortest scheduling policies with examples for each. **(10)**

A bunch of jobs is arriving in the Ready Queue as shown below using SRT and RR(Q=5). Calculate the average turn around time. Draw the Gantt chart and describe which policy provides better results?

JOB	A.T	E.R.T
1	0	10
2	1	06
3	2	12
4	3	11
5	4	5

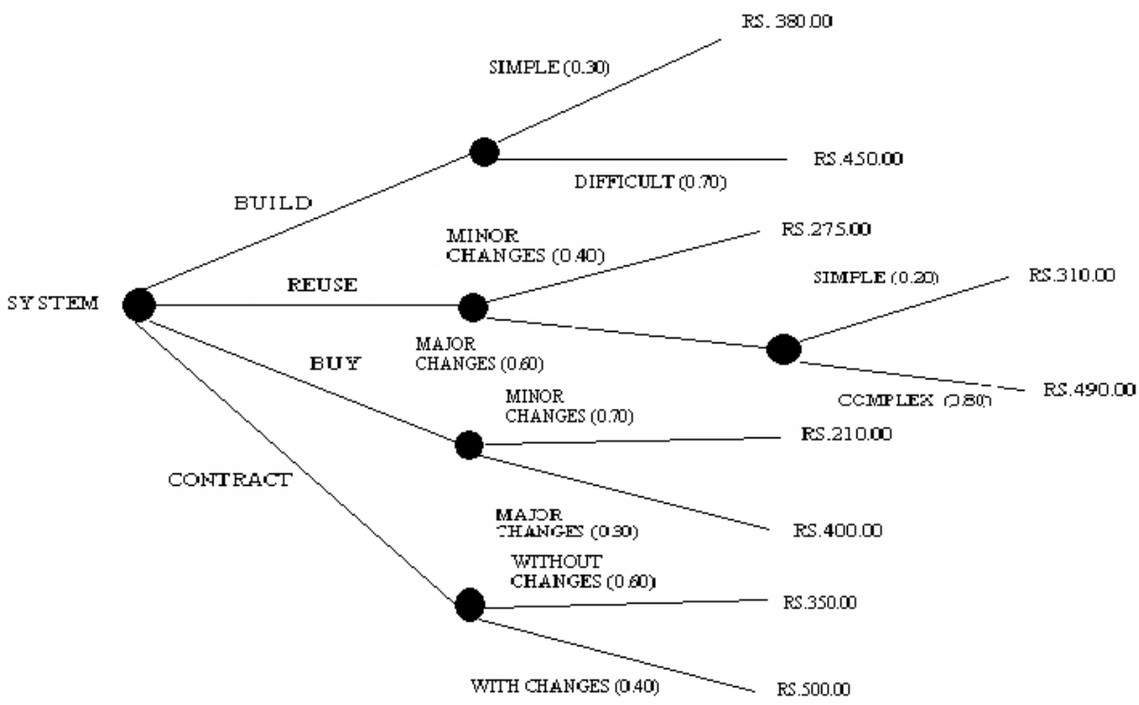
Q.3. (a) Consider a slotted ring of length 10 km with a data rate of 10 Mbps and 500 repeaters, each of which introduces a 1-bit delay. Each slot contains room for one source-address byte, one destination-address byte, two data bytes and five control bits for a total length of 37 bits. How many slots are on the ring? **(09)**

(b) Compare the capacity allocation schemes for IEEE 802.5 token ring and FDDI. What are the relative pros and cons? **(05)**

(c) Compare the individual fields of the IPv4 header with the IPv6 header. Account for the functionality provided by each IPv4 field by showing how the same functionality is provided in IPv6. **(06)**

SECTION – B

Q.4. (a) Calculate the software cost for building, reusing, buying and contracting a software system by considering the following decision tree diagram. What decision would you like to take for this kind of software system? **(12)**



(b) Software requirement analysis is unquestionably the communication intensive step in the software process. Why does the communication path frequently break down? **(08)**

Q.5. **(a)** What is polymorphism? How can we achieve polymorphism in Java and what are its prerequisites? **(08)**

(b) Write exception hierarchy in Java. Enlist the methods of Arithmetic exception, I/O Exception, Array Index Out of Bounds Exception Classes. **(12)**

Q.6. **(a)** Describe the use of Print Stack Trace Method. Consider STACK with memory size 8. Initially it is empty. Find out the output of the following algorithm: **(09)**

step 1. Set X :=4 and y :=6
step 2. Call PUSH(STACK, X+Y)
step 3. Call PUSH(STACK, 5)
step 4. Call PUSH(STACK, X+4)
step 5. Call PUSH(STACK, Y-3)
step 6. Call PUSH(STACK, Y-X)
step 7. Repeat while TOP !=NULL
Call POP(STACK, ITEM)
Write: ITEM
[loop ends]
step 8. Exit

(b) Elucidate the concept of Hashing. Explain in brief the various methods used to avoid collision in Hashing. **(04)**

(c) Insert Key Records: 76, 93, 40, 47, 10, 55 (in this sequence) into the Hash Table of length m = 7 with the Hash Function H(K) = K mod m. Perform linear and quadratic probing. **(07)**

SECTION – C

Q.7. Write Short notes on the following: **(5 x 4 = 20)**

(a) Block Structure of PL/SQL **(b)** Database Security

(c) Cybertalk: A new way to communicate **(d)** The promise of virtual reality

Q.8. **(a)** What is normalization process? Explain the steps to normalize a relation with suitable examples. **(09)**

(b) Explain the DIFFERENCE between Client Side Technologies and the Server Side Technologies with some examples. **(06)**

(c) Define the following briefly: **(1 x 5 = 5)**

(i) VBscript **(ii)** Servlet

(iii) CGI **(iv)** UDDI

(v) SOAP

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